

Claims

1. A method of altering paper fibers or pulp fibers in a watery suspension,
in which the pulp (F) is guided through at least one refining zone (3) which lies between refining surfaces (1, 2),
in which the refining surfaces (1, 2) are moved relative to one another and are pressed toward one another,
whereby mechanical refining work is transmitted to the fibers such that the strengths of the paper made therefrom change,
characterized in that,
the relative speed between the pulp (F) and the refining surfaces, considered in the main direction of movement of the refining surfaces, is at most 10% of the absolute speed of the refining surface driven the fastest at the position (5) at which two refining surfaces (1, 2) are closest in the refining zone (3), such that no shear forces, or at most very low shear forces, are transmitted to the fibers in the refining zone (3).
2. A method in accordance with claim 1, characterized in that the relative speed between the pulp (F) and the refining surfaces, considered in the main direction of movement of the refining surfaces, is lower than 5% of the absolute speed of the refining surface driven the fastest at the position (5) at which two refining surfaces (1, 2) are closest in the refining zone (3).
3. A method in accordance with claim 1 or claim 2, characterized in that the relative movement of the refining surfaces (1, 2) is a roll-off movement.

4. A method in accordance with claim 1, claim 2 or claim 3, characterized in that the mechanical refining work is transmitted by compressing the pulp.
5. A method in accordance with claim 1, claim 2, claim 3 or claim 4, characterized in that a refining surface (1) is provided with grooves (4, 4') which extend transversely to the main direction of movement of the moved refining surface.
6. A method in accordance with claim 5, characterized in that the grooves (4, 4") have a depth (t) of at least 2 mm and an extent (u) in the direction of movement of the moved refining surfaces of at least 2 mm.
7. A method in accordance with claim 5 or claim 6, characterized in that the second refining surface (2) is not provided with transversely extending grooves.
8. A method in accordance with any one of the preceding claims, characterized in that one refining surface (1) is located outwardly on a cylindrical refining body (9) whose center line is moved relative to a refining drum (8) which includes the other refining surface (2) on its inner side.
9. A method in accordance with claim 8, characterized in that a plurality of refining bodies (9) are used in a refining drum (8).

10. A method in accordance with any one of the preceding claims, characterized in that the pulp (F) is not moved relative to one of the refining surfaces (1, 2) in the refining zone (3).
11. A method in accordance with any one of the preceding claims, characterized in that the fibers are present in a suspension with at most 10% solid content.
12. A method in accordance with claim 11, characterized in that the solid content amounts to at most 6%.
13. A method in accordance with any one of the preceding claims, characterized in that the absolute speed of at least one refining surface (1, 2) is kept to a value between 8 and 30 m/sec.
14. A method in accordance with any one of the preceding claims, characterized in that the refining surfaces (1, 2) are pressed toward one another such that a line force arises in the refining zone (3) between 2 and 10 N/mm.